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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/932,228	09/17/1997	KLAUS F. SCHUEGRAF	MICRON.009DV	5093

7590 03/13/2002

KNOBBE MARTENS OLSON AND BEAR  
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SIXTEENTH FLOOR  
NEWPORT BEACH, CA 926608016

EXAMINER

VU, HUNG K

ART UNIT PAPER NUMBER

2811

DATE MAILED: 03/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 08/932,228	Applicant(s) SCHUEGRAF ET AL.	
	Examiner Hung K. Vu	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 December 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-16 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-16 and 21-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |                                                                                              |                                                                             |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Upon further consideration, the finality of last Office Action is withdrawn. In view of a further search, however, a new rejection is set forth further below.

### ***Claim Objections***

2. Claim 23 is objected to because of the following informalities: In claim 23, line 2, "dielectric material" should be changed to "halide-doped silicon oxide" for clarity. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 21, 22, and 24 are rejected under 35 U.S.C. 102(a) as being anticipated by Anjum et al. (PN 5,372,951, of record). Note Figure 5 of Anjum et al..

Anjum et al. discloses an integrated circuit having a plurality of isolation regions within a semiconductor substrate, each isolation region defined by;

a trench within the substrate;

a halide-doped silicon oxide (36,38) filling the trench to form an isolation element;  
wherein the halide-doped silicon oxide has a dielectric constant of less than 3.9;  
wherein the halide-doped silicon oxide comprises fluoride-doped silicon dioxide.

It is noted that in the claim 21, the terms "the trench having a characteristic profile produced by an etch process" and "the substrate retaining the characteristic profile of the trench" are method recitations in a device claimed, and they are non-limiting, because only the final product is relevant, not the method of making. A product by process claim is directed to the product per se, no matter how actually made. See also MPEP 2113. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-16 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bose (PN 5,492,858, of record) in view of Nishiyama et al. (PN 5,429,995).

Bose et al. discloses an isolation structure in a semiconductor substrate comprising,

a recessed portion (20,21,22) formed with a vertical sidewall within the semiconductor substrate (10);

a dielectric material (14) filling the recessed portion;

wherein the recessed portion comprises a trench structure having a ratio of height to width of less than 2:1;

a barrier layer (13,18) disposed between the recessed portion of the semiconductor substrate and the dielectric material. Note Figures 1-5 of Bose et al..

Bose et al. discloses the dielectric material comprising silicon oxide. Bose et al. does not disclose the silicon oxide comprising a halide-dopant. However, Nishiyama et al. discloses an insulating film (22,24,26) for electrically isolation comprising silicon oxide comprised halide-dopant. Note Figures 2A – 11A of Nishiyama et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the recessed portion of Bose et al. having the silicon oxide comprising halide-doped, such as taught by Nishiyama et al. in order to reduce capacitance coupling and to reduce moisture absorption in the insulating film.

With regard to claim 13, Bose et al. and Nishiyama et al. disclose all of the claimed limitations except the trench having a depth of less than 200 nm. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the trench of Bose et al. and Nishiyama et al. having a depth of less than 200 nm because such structure is well-known in the art in order to decrease the void formation and to increase the surface planarity of the final trench structure. Note Swan et al. (PN 5,356,838, of record) of record is cited to support the well-known position.

*Response to Arguments*

5. Applicant's arguments filed 12/31/01 have been fully considered but they are not persuasive.

It is argued, at pages 4-8 of the Argument, that a characteristic profile produced by an etch process is not a process limitation but it is a structure limitation. This argument is not convincing because the term "the trench having a characteristic profile produced by an etch process" is method recitation in a device claimed, and it is non-limiting, because only the final product is relevant, not the method of making. A product by process claim is directed to the product per se, no matter how actually made. See also MPEP 2113. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not. Note that a trench can be formed first, then the halide-doped silicon oxide can be form later by different processes. Therefore, Applicants' claim 21 does not distinguish over the Anjum et al. reference.

5. Applicant's arguments with respect to claims 11 and 21 have been considered but are moot in view of the new ground(s) of rejection.

Art Unit: 2811

*Conclusion*

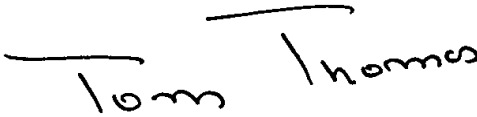
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (703) 308-4079. The examiner can normally be reached on Mon-Thurs 7:00-5:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

March 7, 2002

  
TOM THOMAS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800